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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/042,056	01/10/2002	Roger R. Lesieur	C-2373 Cont.	4487

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EXAMINER
NORTON, NADINE GEORGIANNA

ART UNIT	PAPER NUMBER
1764	

DATE MAILED: 04/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/042,056	LESIEUR ET AL.	
	Examiner	Art Unit	
	Nadine Norton	1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 January 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11 and 20-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11 and 20-25* is/are rejected.

7)☒ Claim(s) *3* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Specification

The abstract of the disclosure is objected to because it is greater than 150 words.

Correction is required. See MPEP § 608.01(b).

Claim Objections

Claim 3 is objected to because of the following informalities: It appears as if the term "desulfurinzing" should be changed to "desulfurizing". Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-8 and 20-25 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Setzer et al.(3,485,746).

Applicants are claiming several methods for desulfurizing a feed which involve processing an oxygenate containing feed over a nickel desulfurization station.

The reference of Setzer et al.(3,485,746) discloses a process for desulfurizing a hydrocarbon fuel containing organic sulfur compounds such as thiophenes and mercaptans for use in a fuel cell. See column 1, lines 20-25 and column 2, lines 35-43. The disclosed process is suitable for processes that are effected be trace amounts of sulfur. See column 1, lines 22-23. The process involves adding water (steam) to a fuel and contacting the water containing fuel with nickel metal. See Fig.1, page 1, column 1, lines 62-66. The desulfurization is conducted at a temperature of 500-900°F. See column 1, lines 69-70. The nickel bed is converted to nickel sulfide. See column 3, lines 26-29. The reference further teaches that it is thought that oxygen from the steam forms a protective layer on the nickel particles, thereby preventing undesirable coke formation in the bed. See column 3, lines 32-45.

The reference of Setzer et al.(3,485,746) succeeds in disclosing a process for desulfurizing a fuel suitable for use in fuel cells. The reference succeeds at disclosing the addition of an oxygenate in the form of water. In addition, the reference succeeds in disclosing a nickel reactant-absorbent for converting organic sulfur compounds to nickel sulfide which is considered to correspond to applicants' desulfurization station.

Several differences are noted between the reference of Setzer et al.(3,485,746) and applicants' claimed invention. The reference is silent about the process effluent containing less than 0.05 ppm sulfur. The reference does not disclose maintaining the desulfurization station (nickel bed) at a temperature in the range of 300-450°F. The reference is also silent about the

recirculating of water. The reference is silent about the processing of the specific gaseous feed claimed by applicants.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to desulfurize the Setzer et al.(3,485,746) fuel to any degree required to produce a suitable fuel cell feed, including applicants' less than 0.05 ppm sulfur, because the reference discloses that the method is desirable for sensitive processes which are affected by trace quantities of sulfur. It is within the level of ordinary skill to practice a known desulfurization process to attain a desired level of desulfurization.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to accomplish the desulfurization of Setzer et al.(3,485,746) at a temperature of 450°F because the prior art range is close enough that one skilled in the art would have expected it to have the same properties. Applicants have not shown anything unexpected with respect to the claimed temperatures.

In addition, it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize water obtained from any source in the Setzer et al.(3,485,746), including a recycle from a selective oxidizer output, because the water composition is the same regardless of the source. It is within the level of ordinary skill in the art to recycle in a known process.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to process any feed applicable to a fuel cell according to the process of Setzer et al(3,485,746) , including applicants' specific gaseous feeds because the reference of Setzer et al.(3,485,746) does not limit the specific hydrocarbon feeds. In the absence of unexpected

results, any hydrocarbon fuel suitable for use in a fuel cell would be expected to be suitable for treatment in the Setzer et al.(3,485,746) process.

Claim Rejections - 35 USC § 103

Claims 9-11 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Setzer et al.(3,485,746) in view of Alexander et al.(6,103,103).

See teachings of Setzer et al.(3,485,746) and statements of obviousness above.

Several additional differences are noted between the reference of Alexander et al.(6,103,103) and applicants' claimed invention. Setzer et al.(3,485,746) does not disclose alcohol or ether oxygenates. It is also noted that the reference of Setzer et al.(3,485,746) does not disclose the production of isobutylene and methanol products.

The reference of Alexander et al.(6,103,103) is cited to show that conventional gasoline marketed in large metropolitan areas contains oxygenates including, methanol, ethanol and MTBE (methyl tertiary butyl ether). See column 1, lines 1-25. Such compounds are known to have high blending octanes. See column 1, lines 26-28.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to treat a fuel containing oxygenates such as methanol, ethanol or MTBE (methyl tertiary butyl ether) according to the Setzer et al.(3,485,746) because Alexander et al.(6,103,103) illustrates that it is conventional for such fuels to contain oxygenates which are known to desirably have high blending octanes. Motivation to include oxygenates in the fuel is derived from the fact that such oxygenate eadditives have high blending octanes (note: high octane indicates a high resistance to undesirable knock). One of ordinary skill desiring to reduce knock

would add such oxygenates to fuel which are known to improve octane. In addition, applicants' methanol/isobutylene production limitations are not considered to be patentable distinctions because the formation of isobutylene or methanol would naturally result from processing a feed containing the oxygenates of Alexander et al.(6,103,103) over the nickel catalyst of Setzer et al.(3,485,746).

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-2, 4-11 and 20-25 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-18 of copending Application Nos. 09/512,035 and 10/076,670. Although the conflicting claims are not identical, they are not patentably distinct from each other because both sets of claims are drawn to a process of desulfurizing a feed which contains an oxygenate.

Several differences are noted between the present claims and the claims of applications 09/512,035 and 10/076,670. The present claims produce a fuel which is suitable for use in a fuel power plant whereas the claims of 09/512,035 and 10/076,670 prepare a fuel which is suitable

for use in an internal combustion engine. In addition, the claims of 09/512,035 and 10/076,670 include several limitations directed at processing a "diesel" fuel whereas the present claims do not. Furthermore, 09/512,035 and 10/076,670 do not disclose introducing water mixed with a gasoline into the nickel desulfurization station, wherein the water is obtained by recirculating a portion of a selective oxidizer output.

Applicants' preamble limitation pertaining to a fuel suitable for use in a fuel cell power plant is not considered to be a patentable distinction over the claims of 09/512,035 or 10/076,670 because it does not further define the "process" steps. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the desulfurized fuel produced by the claims of 09/512,035 or 10/076,670 for any new purpose, including in a fuel cell plant, because it has been held that the claiming of a new use, new function, or unknown property which is inherently present in the prior art does not necessarily make a claim patentable. See In re Best, Bolton and Shaw, 195 USPQ 430, 433 (CCPA 1977).

In addition, it would have been obvious to one of ordinary skill in the art at the time the invention was made to treat any hydrocarbon fuel containing undesirable sulfur and oxygenates, including a diesel fuel, because the present claims do not limit the types of fuels containing sulfur and oxygenates. In the absence of unexpected results, any fuel containing sulfur and oxygenates could be processed according to the present claims.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize water obtained from any source in the claims of 09/512,035 or 10/076,670, including a recycle from a selective oxidizer output, because the water composition is the same

regardless of the source. It is within the level of ordinary skill in the art to recycle in a known process.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claims 1, 2, 4-8 and 21-23 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims1-3 of U.S. Patent No. 6,454,935. Although the conflicting claims are not identical, they are not patentably distinct from each other because both sets of claims are directed at a process for sulfur removal.

Several differences are noted between applicants' claims and the claims of U.S. Patent No. 6,454,935. The claims of U.S. Patent No. 6,454,935 include limitations directed at water being consumed during the desulfurization step whereas applicants' pending claims do not. In addition, several of applicant's claims are broadly directed at the treatment of a hydrocarbon fuel whereas the claims of U.S. Patent No. 6,454,935 are limited to the treatment of a gasoline fuel.

It would have been obvious to one of ordinary skill in the art at the time the invention was made that the process of applicants' present claims would similarly consume water because the same water containing feed is contacted with the same nickel composition that is responsible for the water consumption.

It would be obvious to one of ordinary skill in the art at the time the invention was made to select gasoline as the hydrocarbon fuel in applicant's pending claims because gasoline is a known fuel for a fuel cell power plant.

Double Patenting

A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

Claims 1-11 and 20-25 are provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 1-11 and 20-25 of copending Application No. 10/076,669. This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

Response to Arguments

Applicants' arguments have been fully considered but they are not persuasive.

Applicants' arguments that the present invention distinguishes over the reference of Setzer et al. (3,485,746) because it requires the effluent feed to contain less than 0.05 ppm sulfur whereas the process of Setzer et al. (3,485,746) produces a stream containing 20 ppm sulfur are not persuasive because of 1) the reasons set forth in the response to applicants' arguments in US Application 09/470,483 and 2) the additional reasons explained below.

1) Repeat of Arguments in Application 09/470,483

In response, it is maintained that the reference of Setzer et al. (3,485,746) encompasses desulfurization effluents which contain less than 20 ppm sulfur. The 20 ppm referred to by

applicants is the amount of sulfur detected during "breakthrough" (column 3, lines 14-16). The term breakthrough is known to refer to the point at which the catalyst/adsorbent has exhausted its capacity to remove sulfur and begins to undesirably pass sulfur through the system. The amount of sulfur in the effluent at a breakthrough point is not representative of the amount of sulfur in the effluent prior to breakthrough, which is less. In support of the argument that the initial portion of the desulfurized effluent contains less than the 20 ppm sulfur detected at breakthrough, applicants are directed to column 4, lines 33-36, where it is disclosed that "prior to the actual breakthrough sulfur contents in the effluent stream were generally below those amounts detectable by all but the more refined methods". Since the reference of Setzer et al. (3,485,746) suggests that sulfur is undesirable for sensitive processes, one of ordinary skill in the art would be motivated to reduce sulfur to as low a level as is acceptable. The reference's disclosure of "amounts below those amounts detectable" suggests a low amount which may encompass applicants' 0.05 ppm.

2) Additional Arguments Asserting Obviousness of 0.05 ppm Sulfur

In addition, one of ordinary skill in the art would be motivated to remove as much sulfur as possible, including to a level of 0.05 ppm, because sulfur is a known contaminant. Motivation to remove as much as possible is derived from the fact that it is known that it is beneficial to avoid the known deleterious effects of sulfur in a hydrocarbon fuel. Furthermore, the disclosed amount of less than 20 ppm (e.g. 0-20 ppm) is considered to overlap applicants' 0.05 ppm. In the case where the claimed ranges overlap or lie inside the ranges disclosed by the prior art, a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA).

Applicants' arguments attempting to distinguish the present invention over the process of Setzer et al. (3,485,746) by maintaining that applicants' desulfurization temperature of 300 – 450 °F differs from the desulfurization temperature of Setzer et al. (3,485,746) are not persuasive. In response, it is maintained that the 500 – 900 °F temperature disclosed by Setzer et al. (3,485,746) is only a preferred embodiment (see column 1, lines 67-68). The disclosure of a preferred embodiment does not prohibit other possible elevated temperatures. It is maintained that the reference only requires that the feed be exposed at "elevated" temperature. See column 1, lines 64-66. The reference's disclosure of elevated temperature suggests that any elevated temperature would accomplish the desired conversion. Since applicants' claimed range is "elevated", it is in purview of the broad disclosure of Setzer et al.(3,485,746). Applicants have not successfully argued that applicants' claimed temperature range is not encompassed by the broad disclosure of elevated temperature.

Applicants' arguments asserting that the secondary reference of Alexander teaches away from applicants' claimed oxygenates are not persuasive in overcoming the combination of references. In response, it is maintained that the secondary reference of Alexander was relied on for the teaching in its prior art section that oxygenates are known fuel additives (e.g. enhancers). The fact that the secondary reference teaches an alternative to such enhancers does not negate the general teaching that such oxygenate additives are known. One of ordinary skill in the art would be motivated to add applicants' claimed oxygenates to the fuel of Setzer et al.(4,485,746) because such oxygenates are known to improve fuel octane as evidenced by the secondary reference. Motivation to add applicants' claimed oxygenates is derived from the desire to obtain the known benefits of such additives (e.g. a high octane fuel).

Applicants' arguments with respect to the double patenting rejection over 09/512,035 are not persuasive. The double patenting rejection is maintained because it is important that dual ownership be prevented.

Prior Art of Record

The prior art made of record and not relied upon is considered pertinent to applicants' disclosure.

The attached references are cited to show the relative state of the art with respect to fuel desulfurization in the presence of nickel containing catalysts/adsorbents.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nadine Norton whose telephone number is 703-305-2667. The examiner can normally be reached on Monday through Thursday from 8:30 am to 7:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 703-308-6824. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 308-0661.

N.N.
April 4, 2003

NADINE G. NORTON
PRIMARY EXAMINER